

Laying and fixing system for pipes of various circuits,  
domestic or industrial

Background of the invention

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The invention relates to a laying and fixing system for pipes of various circuits, domestic or industrial.

10 It therefore relates to pipes for heating, hot and cold water supply, and all other fluid circuits as well as pipes for the protection of electrical circuits or signal-transmission circuits. During the construction of a network of pipes, it is necessary to preform each pipe on site and preposition it before fixing it in  
15 place definitively. These operations then have to be repeated for each pipe or conduit.

This preparation is time-consuming for the metal or plastic pipes which are bent on demand, but also pipes  
20 made up of straight lengths connected by T or C fittings attached by welding, brazing or adhesive bonding.

Description of the prior art

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Documents FR 1 319 291, FR 2 568 730 and BE 571 724 disclose moldings or ducts formed from a continuous profile comprising a fixing mounting plate with a flat back covered by an adhesive layer and at least two  
30 opposing flexible wings defining a closed C, these wings being able to be pushed apart elastically to allow the insertion of one or more conductors into the cavity which they form. In document FR 2 568 730 the profile may comprise several juxtaposed receiving  
35 cavities that can be separated at the time of laying, while in document BE 571 724 the duct comprises one or two juxtaposed and inseparable cavities formed by C-shaped wings, that is to say having separated edges.

In shape and structure, these ducts for electrical conductors are unsuitable for laying more rigid, heavier pipes of larger transverse dimensions than the conductors and in particular would be unable, by the force of the adhesive alone, to ensure permanent fixing of one or more pipes having a greater mass per unit length. Furthermore, with visible pipes, these supports would form an aesthetically unpleasing system requiring complementary means to conceal them.

#### Summary of the invention

Taking ducts for electrical conductors as a starting point, it is an object of the present invention to provide a fixing duct for pipes that simplifies the pipe installation process, and reduces laying time and costs while doing away with any finishing operation for pipes that remain visible.

The invention therefore relates to a duct comprising a plastic profile with a mounting plate whose back is supplied with an adhesive fixing means for fixing it to a wall and whose front is provided with elastically deformable wings in pairs defining a longitudinal cavity for receiving and retaining an elongate body.

According to the invention, the deformable wings are those of longitudinal open C-section gutters projecting from the front of the mounting plate and separated transversely from each other by a gap E, at least one of the wings of each gutter being molded integrally with the mounting plate and made of the same semirigid material, while, on the one hand, the said mounting plate of the profile is divided into sub-lengths by breakable or precut transverse lines coinciding with transverse slots formed through the gutters, in order to form independent ducts in this profile and on the other hand, the system also comprises a plastic

finishing profile which, having fixing means for clipping it onto the gutters or pipes, can be cut to length to cover one or more ducts and the associated pipes, along a rectilinear part of laid, fixed pipes.

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Thus, when the pipes have been formed to shape, that is to say bent and formed or cut into straight sub-lengths, they are put in position by clipping onto them sub-lengths of duct and pressing the back of these sub-lengths, their peel-off film having first been removed, onto the wall, to which they can later be fixed by other mechanical means, such as screws or equivalent. When all the pipes are laid and fixed and require concealing, the finishing profile is cut into straight sub-lengths, by straight or oblique cuts, and is clipped onto the installation. In this way, a single finishing sub-length conceals from view one or more ducts and the pipes contained inside them.

20 By this means all the laying operations are effected faster than by the traditional method and the resulting installations are more finished and more aesthetically pleasing.

25 In one embodiment, at least one longitudinal gutter, of smaller internal diametrical dimension than the pipe gutters, project from the mounting plate into the gap E between two pipe gutters to accommodate and retain an insulated conductor of a circuit for the transmission of electrical or optical signals.

35 In another embodiment, the finishing profile comprises, projecting from its back, various longitudinal open C-section gutters, each able to receive and retain an insulated conductor, for the transmission of electrical or optical signals, that fits in the gap E between the pipe gutters of the duct.

Each of these two provisions enables the pipe ducts or

the finishing profile to be used for laying and retaining a variety of conductors. This is particularly beneficial when it comes to electrical or optical circuits which may be added well after the pipes have  
5 been installed, as it saves making chases in the walls, or using other contrivances to conceal these conductors in a habitable room where for example pipes have been laid along the baseboard or cornice and concealed by a finishing profile.

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Other features and advantages will emerge from the following description referring to the appended schematic drawing showing, by way of examples, a number of embodiments of the duct according to the invention.

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Brief description of the drawings.

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Figure 1 is a perspective view of a first embodiment of the system according to the invention designed for two pipes,

Figure 2 is a side view in cross section of another embodiment of the duct, when laid against a wall,

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Figure 3 is a front elevation showing the application of the device to the positioning of two pipes carrying hot and cold water to a hand wash basin,

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Figure 4 is an end view of another embodiment of the system,

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Figures 5 and 6 are partial side views of a pipe gutter showing two embodiments of liners that can be put in it,

Figure 7 is a partial sectional view of another embodiment of the pipe gutter,

Figure 8 is a partial sectional view of another

embodiment of the pipe gutter,

Figures 9 to 12 are sectional side views of other embodiments of the system,

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Figure 13 is a partial perspective view of a room fitted with the system laid along the baseboard and running around a door, and

10 Figures 14 to 18 show other embodiments of the system.

#### Description of the preferred embodiments

15 In Figure 1, the reference A denotes a semirigid plastic profile comprising a mounting plate 2, on the back of which is a layer of adhesive 3 protected by a peel-off film 4. Projecting from the front of the mounting plate 2 are two open C-section gutters 5 whose internal dimension is appropriate for the pipes 6 with  
20 which these gutters are intended to engage. The two gutters are separated by a space E equal to or greater than the usual spacing of the pipes of the network in question.

25 In this space, the mounting plate 2 comprises one or more breakable longitudinal lines 7 consisting of a reduction in the thickness of its component material, and/or consisting of precuts (not shown). It also comprises breakable transverse lines 11 that are also  
30 formed by a thinning of the material or by a precut, and coincide with slots 21 running through the gutters 5 all the way to the mounting plate 2. In practice the spacing P from each breakable line and slit 21 to the next is about 10 centimeters.

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The profile A is accompanied by a finishing profile B made of a semirigid or flexible plastic and intended to form a cap to conceal the ducts and pipes.

When constructing a hot and cold water supply system with two pipes, as shown in Figure 3, as the installer forms the pipes 6 to the correct shape, for example by bending them at 10 and cutting them to length, he prepositions them on the wall where they are to be fixed. Once all the components of a sub-length of the system are correct they are positioned on the wall using either a length of the duct profile, as shown at T1 and T3 in figure 3, this length being a multiple of the spacing P between two breakable lines 11 of the profile A, or a number of independent ducts T2, obtained by cutting sub-lengths of the base profile A. Each element T1, T2 or T3 is first placed on the pipes 6 by clipping its gutters 5 onto them, i.e. by forcing their wings apart so that they pass the diametrical plane of the pipe before returning elastically to their original position. After removing the films 4 from the back of each of the elements T1 and T2, the latter are stuck to the wall.

The adhesive layer 3 has sufficient holding power to keep the lengths of piping in position while the installer continues laying out the rest of the installation, for example fitting the tee joints 8 of the circuit branch consisting of two lengths of pipe 9 installed for example in a length T3 of the support profile.

If need be, for example if the two pipes have to follow different paths, the profile A of the duct is divided lengthwise into two independent elements by separating it along one of its breakable longitudinal lines 7.

Once all or part of the installation is in position, final fixing of the pipes is carried out by means of staples, collars, screws or any other means known to the installer. At this point the profile B is cut into covering sub-lengths C1, C2 and C3 so that they will cover a straight section of the laid pipe network, that

is the supports T1, T2 and T3 and the pipes projecting from them.

5 The profile B entirely conceals the whole installation from view and forms a whole but does not detract from the appearance of the room in which it is laid, and even allows it to be run against the walls, along the baseboard or cornice, and if necessary to be run around window frames and doorframes.

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The embodiment shown in Figure 2 differs from the previous embodiment in that each of the two gutters 5a is still C-shaped but has an opening 16 turned to one side rather than away from the mounting plate 2. This figure also shows that the angle subtended by the opening 16 to the center a extends from a value of at least 90° up to 170° to suit the deformation characteristics of the material of the support, in order that the cylindrical pipes 6 can be clipped into and held by each gutter.

15 This Figure 2 also shows that, in the gap between the two gutters 5a, it is possible to provide a gutter 12 of smaller diametrical dimension: this can be used for laying insulated conductors, for transmitting low-voltage current or electrical or optical signals.

20 In the embodiment shown in Figure 4, the duct equipped with two gutters 5a engages with a finishing profile 13 forming a cap. It has a U-shaped cross section with wings 13b provided with clip-fastening means such as spurs 14 able to engage elastically in grooves 31 at the foot of each gutter. The web 13a of the cap comprises, as shown in Figure 4, two gutters 17 projecting from its back into the gap E between the pipe gutters 5a. These gutters 17 are also intended to take insulated conductors for carrying low-voltage current or for transmitting electrical optical signals.

The number of pipe gutters 5 carried by any one support may of course be other than two, and may be one, three or four, for example, depending on the application.

5 In the same way the inside diameter D of each gutter 5 or 5a varies as a function of the application, i.e. washing, heating, carrying industrial fluids. However, for ordinary applications the inside diameter D, in Figure 5, is that of the largest outside pipe diameter  
10 6 encountered, such as 18 millimeters for a pipe carrying water for washing. In this case and in order to retain pipes 6d of smaller outside diameter, liners 22 in the form of an open C are put in place in the gutters as shown in Figure 5. These liners are made of  
15 flexible plastic so as not to add their stiffness to that of the wings of the gutters. They have an outside dimension that enables them to be clipped into the gutters and an inside diameter equal to the outside diameter of standardized pipes, such as 16, 12 or 10 mm.

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In Figure 6 the liner 23 is H-shaped, that is it consists of a central straight bar connecting two curvilinear bars. It defines two housings 23a, each  
25 24. This type of liner makes it possible to use the pipe gutter or gutters that have been left vacant, for carrying various conductors.

30 The liner 20 could have four housings if given a second straight bar perpendicular to the first straight bar.

Figure 7 shows that each of the pipe gutters, which hitherto had two wings integral with the mounting plate 2, may have only one wing integral with this mounting  
35 plate, for example the wing 5f, and have a wing 5m connected to a lug 25. This lug is able to slide relative to the mounting plate 2 so as to form, between the wings 5f and 5m, an oblong housing capable of accommodating a pipe having this cross section or a

pipe of larger diameter. The lug 25 is made fast by a screw 26, which passes through an oblong hole 27 and screws into a nut 28 embedded in the mounting plate 2.

5 Although not shown in the drawing, it is envisioned that each wing of the gutter 5 be able to slide relative to the mounting plate 2. This enables the angle of the pipe to be adjusted so that a slope can be given to a drain pipe.

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Notice that the mounting plate 2 can also be reinforced by a rigid plate embedded within it or may contain any insert that allows its final fixing such as wall plugs. As shown in Figure 8, the mounting plate 2 can also be  
15 pierced by holes 29 for the passage of screws, sleeves or wall plugs 30, as shown in Figure 12.

In the embodiment of Figure 8, the longitudinal edge of each of the wings of each of the gutters 5 of a support  
20 is given a spur 32, tooth or equivalent means for engaging with the spur 33a, or complementary tooth, formed on each edge of a clip 33. The latter is fitted onto the gutter after the latter has taken a pipe whose outside diameter is greater than that for which it is  
25 designed and which could therefore come out under the elastic loading on its wings.

This figure also shows that in order to avoid retention of condensation, at least one of the wings 5i of each  
30 gutter 5 is pierced with holes 34 set out lengthwise at a regular pitch that is a submultiple of the pitch P at which the breakable lines 11 of the profile are set apart.

35 In Figure 9, the finishing profile 13d is L-shaped and therefore comprises a web 13e and a wing 13f. The wing 13f has a retaining spur 14 on the outer wing of the upper gutter 5s of the ducts. The finishing profile 13d also includes an integral rib 35 projecting from the

web 13e, one of the edges of which is provided with a spur 35a able to engage with the other wing of the gutter 5s, to help fix the profile 13d on each of the ducts. Additionally, one or more gutters 36 for  
5 conductors project from the web 13e of the profile and fit in the gaps E between pipe gutters 5. When the profile 13d is laid on a series of ducts, the whole has the general form of a baseboard and can be run along the bottom of a wall, as shown in Figure 13.

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In Figure 10, the finishing profile 13g is U-shaped and both of its wings have inner spurs 36 able to clip-fasten onto complementary spurs 37 formed on ribs 38 along the edge of the profile A and each duct T,  
15 detached from this profile. At least part of this profile 13g is molded 13h. Its web 13j which is at a greater transverse distance from the pipe gutter 5 carries, projecting from its inside face, a number of gutters 36 for conductors.

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With this arrangement it is possible, once the pipe network has been installed, to use the circuit described by the installation to install other electrical conductors added as the home expands its  
25 systems, e.g. telephone cable, computer cable, loudspeaker wires, computer-television link etc, and this without having to do anything more than remove and refit the finishing profile 13g on the duct sub-lengths.

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In the variant shown in Figure 11, the profile 13k comprises, projecting from its web, a number of internal ribs 40 with spurs 41 along their free edges, opposing one another so that they can be clipped onto a  
35 pipe gutter 5 or 5a. In the gap between the ribs 40, the web projects outwards to form a throat 42. In this throat the web comprises, locally and at regular intervals, zones 43 where its wall is thinner and can be cut or broken through to install an electrical

accessory, such as a switch, socket, etc. Running alongside the wing 44 of the finishing profile 13k is a longitudinal partition 45 with which it forms an open channel 46 capable of containing one or more insulated  
5 conductors for the transmission of electrical or optical signals. Lastly, the parts of the profile that are intended to come into contact with a surface, such as the wall 47 or the floor 48, have seals against the entrance of at least dust, such as a lip seal 49 or  
10 compressible seal 50.

Figure 12 shows an embodiment suitable for cornice application. The mounting plate 2 of the duct profile is bordered by two lateral flaps 52 for fixing  
15 temporarily to the perpendicular surfaces of a corner between two surfaces 53, 54 and each of these flaps has on its back an adhesive layer 55 protected by a peel-off film. The mounting plate is pierced by holes 56 for the passage of shouldered sleeves 30 which have an end  
20 shaped as a wall plug 30a. The wings 13m of the finishing profile 13l are shaped to hide the flaps 52 and form an attractive cornice. They may, like the web of the profile, take the form of any ordinary molding to improve the decorative effect, and they may be  
25 colored or translucent.

Similarly, the gutters for conductors can carry fixed or flashing hanging lights visible through the material of the finishing profile.

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Figure 16 illustrates another advantageous embodiment in which a partition 63, parallel to the mounting plate 2, is added to the profile A. This partition 63 is pierced with oblong holes 64 in which pipe fixing  
35 members 6 are engaged. These members comprise a spring clip and a T-shaped foot 66 which fits into one of the oblong holes 64 and after a quarter-turn is retained in the latter. The presence of ventilation openings 68 may also be noted.

Whatever its embodiment, the duct according to the invention saves the user having to prepare the positioning of various pipes and conduits, and in particular avoids the need to fix in wall plugs, screw  
5 lugs or collars at the same time as he is shaping the pipes, so that there is a considerable reduction in the amount of time required for installation.

Another advantage is that the duct can be used without  
10 any special skill or any special tool, all that is required being a hammer to cause its adhesive bonding to the wall and some sort of cutting blade to cut it into longitudinal sub-lengths or independent elements.

15 In the more elaborate embodiments, comprising means for retaining conductors and molded finishing profiles, the system according to the invention can be surface-mounted and may or may not follow the outlines of window or door frames. Furthermore, it is envisioned  
20 that the finishing profile 13 be equipped with clips 58 with elastically deformable wings that fit directly onto pipes 6 in order to conceal the latter. Figure 15 shows another variant in which the finishing profile 13 has down-turned clips 59, enabling the profile to be  
25 fixed from above. The profile may however have only one clip 59 as shown in Figure 18.

Figure 17 shows a profile 13 containing a space 68 reserved for running cables, for example. The invention  
30 can of course be produced in any appropriate material. One possibility is to make the finishing profile 13 in wood, clips being attached to it.

Another possibility is to place a layer of insulating  
35 material in the system to insulate the pipes 6.

Moreover, the system can be clipped unobtrusively to a pipe 6 or can be clipped to the collar holding this pipe in position.